

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In the Patent Application of

I-Jong Lin

Application No.: 10/718,151

Filed: November 20, 2003

For: Methods and Systems for Processing  
Displayed Images

Group Art Unit: 2624

Examiner: LIEW, Alex Kok Soon

Confirmation No.: 8992

**REPLY BRIEF**

Mail Stop Appeal Brief - Patents  
Commissioner for Patents  
P.O. Box 1450  
Alexandria, VA 22313-1450

Sir:

This is a Reply Brief under Rule 41.41 (37 C.F.R) in response to the Examiner's Answer of September 7, 2010 (the "Examiner's Answer" or the "Answer"). In Section 10, the Answer contains a response to some of the arguments made in Appellant's brief. Appellant now responds to the Examiner's Answer as follows.

**Status of Claims**

The status of the claims remains unchanged. Claims 1-25 are pending in the application. Of these, claims 1-6 are allowed. Claims 9, 15, and 21 were indicated as containing allowable subject matter, but are still at issue in this appeal because each depends from a rejected base claim. Claims 7, 8, 10-14, 16-20, and 22-25 stand finally rejected. Accordingly, Appellant appeals from the final rejection of claims 7, 8, 10-14, 16-20, and 22-25.

**Grounds of Rejection to be Reviewed on Appeal**

The Answer maintains the following grounds of rejection.

(1) Claims 7, 8, 10, 11, 13, 14, 16, 17, 19, 20, 22, 23, and 25 were rejected under 35 U.S.C. § 102(b) as being anticipated by U.S. Patent No. 5,345,313 to Blank (hereinafter Blank).

(2) Claims 12, 18, and 24 were rejected under 35 U.S.C. § 103(a) over the combined teachings of Blank and U.S. Patent No. 5,208,871 to Eschbach (hereinafter Eschbach).

Accordingly, Appellant hereby requests review of each of these grounds of rejection in the present appeal.

**Argument**

(1) Claims 7, 8, 10, 11, 13, 14, 16, 17, 19, 20, 22, 23, and 25 are patentable over *Blank*:

**Claim 7:**

Claim 7 recites:

A method for processing a displayed image comprising the steps of:  
passively testing a first version of said ***displayed image captured by an image capture device*** to determine if a portion of said displayed image is blocked from said image capture device; and  
actively testing said portion of said displayed image based on said first version of said displayed image and a second version of said displayed image to confirm whether said portion of said displayed image is blocked from said image capture device, wherein said ***second version of said displayed image is captured by said image capture device after being displayed on an electronic display device.***

(Emphasis added).

In contrast, Blank does not teach or suggest “a method for processing a displayed image comprising the steps of passively testing a first version of said displayed image captured by an image capture device to determine if a portion of said displayed image is blocked from said image capture device, and actively testing said portion of said displayed image based on said first version of said displayed image and a second version of said displayed image to confirm whether said portion of said displayed image is blocked from said image capture device, wherein said second version of said displayed image is captured by said image capture device after being displayed on an electronic display device.” (Claim 7). As discussed in previous prosecution, Blank is generally directed to the traditional systems and methods of filming an actor in front of a ***monochromatic background***, which background is later replaced with a desired background image, while retaining the actor in the foreground. (See, e.g., Blank, col. 3, ll. 1-6; col. 6, ll. 1-3; and Fig.1). Specifically, Blank teaches a “monochrome background 24, which can be any desired color.” (Blank, col. 6, ll. 2-3). In

sum, Blank simply teaches the use of, for example, a monochromatic screen in a system that utilizes a technology similar to chromakey, and does not teach, “passively testing a first version of said *displayed image captured by an image capture device.*” (Claim 7). Thus, the system of Blank may be contrasted with, for example, Fig. 2 of Appellant’s disclosure in which an electronic display (22) is placed as the background instead of a monochromatic background as taught in Blank. With this background, Appellant respectfully asserts that Blank does not teach or suggest the subject matter of claim 7.

First, Appellant asserts that Blank does not teach or suggest, “wherein said *second version of said displayed image is captured by said image capture device after being displayed on an electronic display device.*” (Claim 7). In connection with this subject matter, the Examiner’s Answer argues, “element 20 is a video display which displays the object, 22 and background 24, while being displayed, an image is captured using a video grabber, discussed on column 6, lines 60 to column 7, line 3.” (Examiner’s Answer, pp. 5 and 15). The cited portion of Blank teaches:

As shown in Roman numeral I of FIG. 5, only a portion 54 of the camera view is digitized for processing by the Transputer 44. Ordinarily, the signal from the camera 16 is an analog signal, and is digitized into a two-dimensional matrix of pixels (represented in Roman numeral II in FIG. 5) by a video frame grabber such as graphics daughterboard available from perihelion of the United Kingdom, which is included in the transputer 44. (Blank, col. 6, l. 60 through col. 7, l. 3).

However, it is clear from this portion that Blank simply teaches taking individual, digital still frames from an analog video signal. This can not be considered as equivalent to capturing a displayed image with an image capture device after the image is displayed on an electronic display device. Therefore, Blank does not teach or suggest, “wherein said *second version of said displayed image is captured by said image capture device after being*

*displayed on an electronic display device.”* (Claim 7). For at least this reason, the rejection of claim 7 should not be sustained.

Further, on this point, the final Office Action of December 16, 2009 argued that “[s]ince the images in figures 5A-5D are taken in sequences, and the images of the object 22 and display device 24, are constantly displayed on the *electronic display, 22*, Blank reads on wherein said second version of said displayed image is captured by means for capturing after being displayed on said means for *electronically displaying.”* (final Office Action, p. 2). However, this is incorrect.

Blank simply teaches displaying on a monitor 20 an image of a subject 22 and a monochromatic background 24. Clearly, it is physically impossible in the system of Blank for the video camera 16 to capture an image of the monitor 20 because the video camera 16 and monitor 20 are housed in a single apparatus 12. (*See, e.g.*, Blank, Fig. 1). In this manner, the video camera 16 cannot be directed at or toward the monitor 20 in order to capture images of the monitor 20. Stated another way, the video camera 16 of Blank is always directed toward the subject 22 and the monochromatic background 24, and is entirely incapable of imaging the monitor 20. Further, Blank does not teach or suggest that the video camera 16 is capable of imaging the images displayed on the monitor 20. Thus, the system of Blank physically can not “actively test[.] . . . a second version of said displayed image to confirm whether said portion of said displayed image is blocked from said image capture device, wherein said *second version of said displayed image is captured by said image capture device after being displayed on an electronic display device.”*

Second, Appellant respectfully asserts that Blank fails to teach or suggest, “*passively testing* a first version of said displayed image captured by an image capture device to determine if a portion of said displayed image is blocked from said image capture device, and

*actively testing* said portion of said displayed image based on said first version of said displayed image and a second version of said displayed image to confirm whether said portion of said displayed image is blocked from said image capture device.” (Claim 7) (emphasis added). On this point, the Examiner’s Answer argues, “[t]he examiner does not view the limitations passively testing and actively testing as having special definition. Rather, they are given the broadest reasonable interpretation.” (Examiner’s Answer, p. 13). Appellant respectfully disagrees. Passively testing and actively testing are defined in Appellant’s original specification as follows:

This processing involves controlling both the image capture device 20 and the display 22 to cast a virtual shadow of any object(s) which are blocking the image capture device's view of the display. This is accomplished, according to exemplary embodiments of the present invention, by using both an active and a passive testing technique. The *passive technique estimates the image rendered on the display 22 and uses this estimate to determine whether individual pixels are being occluded, without manipulating the display 22*. The *active technique changes pixels on the display 22 to a known color and then the processor 24 observes changes (or lack thereof) in the images subsequently captured by the image capture device 20*. Thus, according to exemplary embodiments of the present invention, the passive technique can be used to identify pixels which are potentially occluded and then, using these pixels as seed areas, the active technique tests and grows these regions outwardly until the occlusion's boundaries are discovered.

(Appellant’s specification, para. [0022], [0024], and [0026], and Figure 4A).

Thus, clearly Appellant’s specification provides definitions of “passively testing” and “actively testing.”

In light of the above findings with regard to “passively testing” and “actively testing,” Appellant respectfully asserts that Blank does not teach or suggest, “*passively testing* a first version of said displayed image captured by an image capture device to determine if a portion of said displayed image is blocked from said image capture device; and *actively testing* said portion of said displayed image based on said first version of said displayed image and a

second version of said displayed image to confirm whether said portion of said displayed image is blocked from said image capture device.” (Claim 7) (emphasis added). As Appellant has stated in previous prosecution, it is clear that although the system of Blank includes a processor configured to process images, the processor of Blank is only configured to store a digital image of an object and a background, locate the edge of an object, and remove portions of the image (i.e., the background) that are outside the edge. (*See*, Blank, Abstract; *passim*). Blank is silent with regard to a processor configured to passively and actively test displayed images to determine if a portion of the displayed images are blocked from an image capture device.

Specifically, Blank is silent regarding an active technique that changes pixels on a display to a known color and then observes changes (or lack thereof) in the images subsequently captured by an image capture device. The Examiner’s Answer argues that this active technique is taught by Blank, and states, “the coarse stripping operation determines whether the current pixel should be part of the edge of a box, wherein the edge of a box contains plurality of pixels determined in steps discussed previously on column 8, lines 44-53.” (Examiner’s Answer, p. 14). However, this portion of Blank, as well as throughout the Blank reference, simply teaches detection of the edge of an object in front of a monochromatic screen and separates the object from the monochromatic screen. (*See, e.g.*, Blank, col. 2, ll. 63-68). Blank is silent regarding changing pixels on a display to a known color and then observing changes (or lack thereof) in the images subsequently captured by an image capture device. For at least this additional reason, the rejection of claim 7 should not be sustained.

Third, in contrast to Blank, claim 7 recites displayed images being displayed on an electronic display device, not merely a monochromatic background. The display device is



then imaged with an imaging device including any objects in the foreground, e.g. a person. The image is then processed to create a virtual shadow of any objects in the foreground, i.e., in front of the electronic display device. This subject matter is clearly not taught or suggested by Blank.

Respectfully, to anticipate a claim, a reference must teach each and every element of the claim, and “the identical invention must be shown *in as complete detail as contained in the ... claim.*” MPEP 2131 citing *Verdegaal Bros. v. Union Oil Co. of California*, 814 F.2d 628, 2 USPQ2d 1051 (Fed. Cir. 1987) and *Richardson v. Suzuki Motor Co.*, 868 F.2d 1226, 9 USPQ2d 1913 (Fed. Cir. 1989) (emphasis added). Moreover, “[t]he prior art reference—in order to anticipate under 35 U.S.C. § 102—must not only disclose all elements of the claim within the four corners of the document, but must also disclose those elements ‘arranged as in the claim.’” *NetMoneyIn v. Verisign*, (Fed. Cir. 2008) (quoting *Connell v. Sears, Roebuck & Co.*, 722 F.2d 1542 (Fed. Cir. 1983)).

In the present case, Blank clearly does not disclose the claimed invention with each and every claimed element in the same amount of detail or as arranged in the claim. Consequently, because Blank clearly fails to satisfy the requirements for anticipating claim 7, the rejection of claim 7 and its dependent claims should not be sustained.

Claim 13:

Claim 13 recites:

A computer-readable medium containing a program that performs the steps of:  
passively testing a first version of *a displayed image captured by an image capture device* to determine if a portion of said displayed image is blocked from said image capture device; and  
actively testing said portion of said displayed image based on said first version of said displayed image and a second version of said displayed image to confirm whether said portion of said displayed image is blocked from said

image capture device, wherein said *second version of said displayed image is captured by said image capture device after being displayed on an electronic display.*

(Emphasis added).

In contrast, Blank does not teach or suggest “a computer-readable medium containing a program that performs the steps of passively testing a first version of a displayed image captured by an image capture device to determine if a portion of said displayed image is blocked from said image capture device, and actively testing said portion of said displayed image based on said first version of said displayed image and a second version of said displayed image to confirm whether said portion of said displayed image is blocked from said image capture device, wherein said second version of said displayed image is captured by said image capture device after being displayed on an electronic display.” (Claim 13).

As explained above, Blank is generally directed to the traditional systems and methods of filming an actor in front of a *monochromatic background*, which background is later replaced with a desired background image, while retaining the actor in the foreground. (See, e.g., Blank, col. 3, ll. 1-6; col. 6, ll. 1-3; and Fig.1). Specifically, Blank teaches a “monochrome background 24, which can be any desired color.” (Blank, col. 6, ll. 2-3). In sum, Blank simply teaches the use of, for example, a monochromatic screen in a system that utilizes a technology similar to chromakey, and does not teach, “passively testing a first version of *a displayed image captured by an image capture device.*” (Claim 13) (emphasis added). Thus, the system of Blank may be contrasted with, for example, Fig. 2 of Appellant’s disclosure in which an electronic display (22) is placed as the background instead of a monochromatic background as taught in Blank.

The Examiner’s Answer argues, “[i]n addition, the examiner does not rely on the ‘use of a blue or green monochromatic screen in a system that utilizes chromakey.’ The examiner

only relies on the teachings of Blanks, where the image is displayed and captured on the screen, 20, in figure 1.” (Examiner’s Answer, p. 17). However, Appellant points out that these statements regarding the use of a chromakey-like system in Blank places in perspective the significant differences in both the physical structures between the system of Blank and the subject matter of the claims, as well as their respective processes and technologies. With this background, Appellant respectfully asserts that Blank does not teach or suggest the subject matter of claim 13.

First, as similarly argued above in connection with the patentability of independent claim 7, Appellant asserts that Blank does not teach or suggest, “wherein said *second version of said displayed image is captured by said image capture device after being displayed on an electronic display device.*” (Claim 13) (emphasis added). In connection with this subject matter, the Examiner’s Answer argues, “element 20 is a video display which displays the object, 22 and background 24, while being displayed, an image is captured using a video grabber, discussed on column 6, lines 60 to column 7, line 3.” (Examiner’s Answer, pp. 5 and 15). The cited portion of Blank teaches:

As shown in Roman numeral I of FIG. 5, only a portion 54 of the camera view is digitized for processing by the Transputer 44. Ordinarily, the signal from the camera 16 is an analog signal, and is digitized into a two-dimensional matrix of pixels (represented in Roman numeral II in FIG. 5) by a video frame grabber such as graphics daughterboard available from perihelion of the United Kingdom, which is included in the transputer 44. (Blank, col. 6, l. 60 through col. 7, l. 3).

However, it is clear from this portion that Blank simply teaches taking individual, digital still frames from an analog video signal. This can not be considered as equivalent to capturing a displayed image with an image capture device after the image is displayed on an electronic display device. Therefore, Blank does not teach or suggest, “wherein said *second version of said displayed image is captured by said image capture device after being*

*displayed on an electronic display device.”* (Claim 13). For at least this reason, the rejection of claim 13 should not be sustained.

Further, on this point, the final Office Action of December 16, 2009 argued that “[s]ince the images in figures 5A-5D are taken in sequences, and the images of the object 22 and display device 24, are constantly displayed on the *electronic display, 22*, Blank reads on wherein said second version of said displayed image is captured by means for capturing after being displayed on said means for *electronically displaying.”* (final Office Action, p. 2). However, this is incorrect.

Blank simply teaches displaying on a monitor 20 an image of a subject 22 and a monochromatic background 24. Clearly, it is physically impossible in the system of Blank for the video camera 16 to capture an image of the monitor 20 because the video camera 16 and monitor 20 are housed in a single apparatus 12. (*See, e.g.,* Blank, Fig. 1). In this manner, the video camera 16 cannot be directed at or toward the monitor 20 in order to capture images of the monitor 20. Stated another way, the video camera 16 of Blank is always directed toward the subject 22 and the monochromatic background 24, and is entirely incapable of imaging the monitor 20. Further, Blank does not teach or suggest that the video camera 16 is capable of imaging the images displayed on the monitor 20. Thus, the system of Blank physically can not “actively test[.] . . . a second version of said displayed image to confirm whether said portion of said displayed image is blocked from said image capture device, wherein said *second version of said displayed image is captured by said image capture device after being displayed on an electronic display device.”* (Claim 13) (emphasis added).

Second, Appellant respectfully asserts that Blank fails to teach or suggest, “*passively testing* a first version of said displayed image captured by an image capture device to determine if a portion of said displayed image is blocked from said image capture device, and

*actively testing* said portion of said displayed image based on said first version of said displayed image and a second version of said displayed image to confirm whether said portion of said displayed image is blocked from said image capture device.” (Claim 13) (emphasis added). On this point, the Examiner’s Answer argues, “[t]he examiner does not view the limitations passively testing and actively testing as having special definition. Rather, they are given the broadest reasonable interpretation.” (Examiner’s Answer, p. 13). Appellant respectfully disagrees. Passively testing and actively testing are defined in Appellant’s original specification as follows:

This processing involves controlling both the image capture device 20 and the display 22 to cast a virtual shadow of any object(s) which are blocking the image capture device's view of the display. This is accomplished, according to exemplary embodiments of the present invention, by using both an active and a passive testing technique. The *passive technique estimates the image rendered on the display 22 and uses this estimate to determine whether individual pixels are being occluded, without manipulating the display 22*. The *active technique changes pixels on the display 22 to a known color and then the processor 24 observes changes (or lack thereof) in the images subsequently captured by the image capture device 20*. Thus, according to exemplary embodiments of the present invention, the passive technique can be used to identify pixels which are potentially occluded and then, using these pixels as seed areas, the active technique tests and grows these regions outwardly until the occlusion's boundaries are discovered.

(Appellant’s specification, para. [0022], [0024], and [0026], and Figure 4A).

Thus, clearly Appellant’s specification provides definitions of “passively testing” and “actively testing.”

In light of the above findings with regard to “passively testing” and “actively testing,” Appellant respectfully asserts that Blank does not teach or suggest, “*passively testing* a first version of said displayed image captured by an image capture device to determine if a portion of said displayed image is blocked from said image capture device, and *actively testing* said portion of said displayed image based on said first version of said displayed image and a

second version of said displayed image to confirm whether said portion of said displayed image is blocked from said image capture device.” (Claim 13) (emphasis added). As Appellant has stated in previous prosecution, it is clear that although the system of Blank includes a processor configured to process images, the processor of Blank is only configured to store a digital image of an object and a background, locate the edge of an object, and remove portions of the image (i.e., the background) that are outside the edge. (*See*, Blank, Abstract; *passim*). Blank is silent with regard to a processor configured to passively and actively test displayed images to determine if a portion of the displayed images are blocked from an image capture device.

Specifically, Blank is silent regarding an active technique that changes pixels on a display to a known color and then observes changes (or lack thereof) in the images subsequently captured by an image capture device. The Examiner’s Answer argues that this active technique is taught by Blank, and states, “the coarse stripping operation determines whether the current pixel should be part of the edge of a box, wherein the edge of a box contains plurality of pixels determined in steps discussed previously on column 8, lines 44-53.” (Examiner’s Answer, p. 17). However, this portion of Blank, as well as throughout the Blank reference, simply teaches detection of the edge of an object in front of a monochromatic screen and separates the object from the monochromatic screen. (*See, e.g.*, Blank, col. 2, ll. 63-68). Blank is silent regarding changing pixels on a display to a known color and then observing changes (or lack thereof) in the images subsequently captured by an image capture device. For at least this additional reason, the rejection of claim 13 should not be sustained.

Third, in contrast to Blank, claim 13 recites displayed images being displayed on an electronic display device, not merely a monochromatic background. The display device is

then imaged with an imaging device including any objects in the foreground, e.g. a person. The image is then processed to create a virtual shadow of any objects in the foreground, i.e., in front of the electronic display device. This subject matter is clearly not taught or suggested by Blank.

Respectfully, to anticipate a claim, a reference must teach each and every element of the claim, and “the identical invention must be shown *in as complete detail as contained in the ... claim.*” MPEP 2131 citing *Verdegaal Bros. v. Union Oil Co. of California*, 814 F.2d 628, 2 USPQ2d 1051 (Fed. Cir. 1987) and *Richardson v. Suzuki Motor Co.*, 868 F.2d 1226, 9 USPQ2d 1913 (Fed. Cir. 1989) (emphasis added). Moreover, “[t]he prior art reference—in order to anticipate under 35 U.S.C. § 102—must not only disclose all elements of the claim within the four corners of the document, but must also disclose those elements ‘arranged as in the claim.’” *NetMoneyIn v. Verisign*, (Fed. Cir. 2008) (quoting *Connell v. Sears, Roebuck & Co.*, 722 F.2d 1542 (Fed. Cir. 1983)).

In the present case, Blank clearly does not disclose the claimed invention with each and every claimed element in the same amount of detail or as arranged in the claim. Consequently, because Blank clearly fails to satisfy the requirements for anticipating claim 13, the rejection of claim 13 and its dependent claims should not be sustained.

Claim 19:

Claim 19 recites:

An image processing system comprising:  
    *an electronic display for displaying an image;*  
    an image capture device *for capturing a first version of said displayed image;* and  
    a processor, connected to said display and said image capture device for *passively testing* said first version of *said displayed image captured by said image capture device* to determine if a portion of said displayed image is

blocked from said image capture device; and for *actively testing* said portion of said displayed image based on said first version of said displayed image and a second version of said displayed image to confirm whether said portion of said displayed image is blocked from said image capture device, wherein said *second version of said displayed image is captured by said image capture device after being displayed on said electronic display.*

(Emphasis added).

In contrast, Blank does not teach or suggest “[a]n image processing system comprising an electronic display for displaying an image, an image capture device for capturing a first version of said displayed image, and a processor, connected to said display and said image capture device for passively testing said first version of said displayed image captured by said image capture device to determine if a portion of said displayed image is blocked from said image capture device; and for actively testing said portion of said displayed image based on said first version of said displayed image and a second version of said displayed image to confirm whether said portion of said displayed image is blocked from said image capture device, wherein said second version of said displayed image is captured by said image capture device after being displayed on said electronic display.” (Claim 19).

As explained above, Blank is generally directed to the traditional systems and methods of filming an actor in front of a *monochromatic background*, which background is later replaced with a desired background image, while retaining the actor in the foreground. (See, e.g., Blank, col. 3, ll. 1-6; col. 6, ll. 1-3; and Fig.1). Specifically, Blank teaches a “monochrome background 24, which can be any desired color.” (Blank, col. 6, ll. 2-3). In sum, Blank simply teaches the use of, for example, a monochromatic screen in a system that utilizes a technology similar to chromakey, and does not teach, “a processor, connected to said display and said image capture device for passively testing said first version of *said displayed image captured by said image capture device.*” (Claim 19) (emphasis added). Thus, the system of Blank may be contrasted with, for example, Fig. 2 of Appellant’s



disclosure in which an electronic display (22) is placed as the background instead of a monochromatic background as taught in Blank. With this background, Appellant respectfully asserts that Blank does not teach or suggest the subject matter of claim 19.

First, Appellant asserts that Blank does not teach or suggest, “wherein said *second version of said displayed image is captured by said image capture device after being displayed on said electronic display.*” (Claim 19) (emphasis added). In connection with this subject matter, the Examiner’s Answer argues, “element 20 is a video display which displays the object, 22 and background 24, while being displayed, an image is captured using a video grabber, discussed on column 6, lines 60 to column 7, line 3.” (Examiner’s Answer, pp. 8 and 15). The cited portion of Blank teaches:

As shown in Roman numeral I of FIG. 5, only a portion 54 of the camera view is digitized for processing by the Transputer 44. Ordinarily, the signal from the camera 16 is an analog signal, and is digitized into a two-dimensional matrix of pixels (represented in Roman numeral II in FIG. 5) by a video frame grabber such as graphics daughterboard available from perihelion of the United Kingdom, which is included in the transputer 44. (Blank, col. 6, l. 60 through col. 7, l. 3).

However, it is clear from this portion that Blank simply teaches taking individual, digital still frames from an analog video signal. This can not be considered as equivalent to capturing a displayed image with an image capture device after the image is displayed on an electronic display device. Therefore, Blank does not teach or suggest, “wherein said *second version of said displayed image is captured by said image capture device after being displayed on said electronic display.*” (Claim 19) (emphasis added). For at least this reason, the rejection of claim 19 should not be sustained.

Further, on this point, the final Office Action of December 16, 2009 argued that “[s]ince the images in figures 5A-5D are taken in sequences, and the images of the object 22 and display device 24, are constantly displayed on the *electronic display*, 22, Blank reads on

wherein said second version of said displayed image is captured by means for capturing after being displayed on said means for *electronically displaying*.” (final Office Action, p. 2).

However, this is incorrect.

Blank simply teaches displaying on a monitor 20 an image of a subject 22 and a monochromatic background 24. Clearly, it is physically impossible in the system of Blank for the video camera 16 to capture an image of the monitor 20 because the video camera 16 and monitor 20 are housed in a single apparatus 12. (*See, e.g.*, Blank, Fig. 1). In this manner, the video camera 16 cannot be directed at or toward the monitor 20 in order to capture images of the monitor 20. Stated another way, the video camera 16 of Blank is always directed toward the subject 22 and the monochromatic background 24, and is entirely incapable of imaging the monitor 20. Further, Blank does not teach or suggest that the video camera 16 is capable of imaging the images displayed on the monitor 20. Thus, the system of Blank physically can not “a processor, connected to said display and said image capture device for passively testing said first version of *said displayed image captured by said image capture device* to determine if a portion of said displayed image is blocked from said image capture device; and for actively testing said portion of said displayed image based on said first version of said displayed image and a second version of said displayed image to confirm whether said portion of said displayed image is blocked from said image capture device, wherein said *second version of said displayed image is captured by said image capture device after being displayed on said electronic display*.” (Claim 19) (emphasis added).

Second, Appellant respectfully asserts that Blank fails to teach or suggest, “a processor, connected to said display and said image capture device for *passively testing* said first version of said displayed image captured by said image capture device to determine if a portion of said displayed image is blocked from said image capture device; and for *actively*

*testing* said portion of said displayed image based on said first version of said displayed image and a second version of said displayed image to confirm whether said portion of said displayed image is blocked from said image capture device.” (Claim 19) (emphasis added). On this point, the Examiner’s Answer argues, “[t]he examiner does not view the limitations passively testing and actively testing as having special definition. Rather, they are given the broadest reasonable interpretation.” (Examiner’s Answer, p. 13). Appellant respectfully disagrees. Passively testing and actively testing are defined in Appellant’s original specification as follows:

This processing involves controlling both the image capture device 20 and the display 22 to cast a virtual shadow of any object(s) which are blocking the image capture device's view of the display. This is accomplished, according to exemplary embodiments of the present invention, by using both an active and a passive testing technique. The *passive technique estimates the image rendered on the display 22 and uses this estimate to determine whether individual pixels are being occluded, without manipulating the display 22*. The *active technique changes pixels on the display 22 to a known color and then the processor 24 observes changes (or lack thereof) in the images subsequently captured by the image capture device 20*. Thus, according to exemplary embodiments of the present invention, the passive technique can be used to identify pixels which are potentially occluded and then, using these pixels as seed areas, the active technique tests and grows these regions outwardly until the occlusion's boundaries are discovered.

(Appellant’s specification, para. [0022], [0024], and [0026], and Figure 4A).

Thus, clearly Appellant’s specification provides definitions of “passively testing” and “actively testing.”

In light of the above findings with regard to “passively testing” and “actively testing,” Appellant respectfully asserts that Blank does not teach or suggest, “a processor, connected to said display and said image capture device for *passively testing* said first version of said displayed image captured by said image capture device to determine if a portion of said displayed image is blocked from said image capture device; and for *actively testing* said

portion of said displayed image based on said first version of said displayed image and a second version of said displayed image to confirm whether said portion of said displayed image is blocked from said image capture device.” (Claim 19) (emphasis added). As Appellant has stated in previous prosecution, it is clear that although the system of Blank includes a processor configured to process images, the processor of Blank is only configured to store a digital image of an object and a background, locate the edge of an object, and remove portions of the image (i.e., the background) that are outside the edge. (*See*, Blank, Abstract; *passim*). Blank is silent with regard to a processor configured to passively and actively test displayed images to determine if a portion of the displayed images are blocked from an image capture device.

Specifically, Blank is silent regarding an active technique that changes pixels on a display to a known color and then observes changes (or lack thereof) in the images subsequently captured by an image capture device. The Examiner’s Answer argues that this active technique is taught by Blank, and states, “the coarse stripping operation determines whether the current pixel should be part of the edge of a box, wherein the edge of a box contains plurality of pixels determined in steps discussed previously on column 8, lines 44-53.” (Examiner’s Answer, p. 19). However, this portion of Blank, as well as throughout the Blank reference, simply teaches detection of the edge of an object in front of a monochromatic screen and separates the object from the monochromatic screen. (*See, e.g.*, Blank, col. 2, ll. 63-68). Blank is silent regarding changing pixels on a display to a known color and then observing changes (or lack thereof) in the images subsequently captured by an image capture device. For at least this additional reason, the rejection of claim 19 should not be sustained.

Third, in contrast to Blank, claim 19 recites displayed images being displayed on an electronic display device, not merely a monochromatic background. Specifically, claim 19 recites, “*an electronic display for displaying an image; an image capture device for capturing a first version of said displayed image; and a processor, connected to said display and said image capture device for passively testing said first version of said displayed image captured by said image capture device . . . wherein said second version of said displayed image is captured by said image capture device after being displayed on said electronic display.*” (Claim 19) (emphasis added). The display device is then imaged with an imaging device including any objects in the foreground, e.g. a person. The image is then processed to create a virtual shadow of any objects in the foreground, i.e., in front of the electronic display device. This subject matter is clearly not taught or suggested by Blank.

Respectfully, to anticipate a claim, a reference must teach each and every element of the claim, and “the identical invention must be shown *in as complete detail as contained in the ... claim.*” MPEP 2131 citing *Verdegaal Bros. v. Union Oil Co. of California*, 814 F.2d 628, 2 USPQ2d 1051 (Fed. Cir. 1987) and *Richardson v. Suzuki Motor Co.*, 868 F.2d 1226, 9 USPQ2d 1913 (Fed. Cir. 1989) (emphasis added). Moreover, “[t]he prior art reference—in order to anticipate under 35 U.S.C. § 102—must not only disclose all elements of the claim within the four corners of the document, but must also disclose those elements ‘arranged as in the claim.’” *NetMoneyIn v. Verisign*, (Fed. Cir. 2008) (quoting *Connell v. Sears, Roebuck & Co.*, 722 F.2d 1542 (Fed. Cir. 1983)).

In the present case, Blank clearly does not disclose the claimed invention with each and every claimed element in the same amount of detail or as arranged in the claim. Consequently, because Blank clearly fails to satisfy the requirements for anticipating claim 19, the rejection of claim 19 and its dependent claims should not be sustained.

Claim 25:

Claim 25 recites:

An image processing system comprising:

*means for electronically displaying an image;*

means for *capturing a first version of said displayed image;* and

means, connected to said means for electronically displaying and said means for capturing, for *passively testing* said first version of said displayed image captured by said means for capturing to determine if a portion of said displayed image is blocked from said means for capturing and for *actively testing* said portion of said displayed image based on said first version of said displayed image and a second version of said displayed image to confirm whether said portion of said displayed image is blocked from said means for capturing, wherein said second version of said displayed image is captured by said means for capturing after being displayed on *said means for electronically displaying*.

(Emphasis added).

In contrast, Blank does not teach or suggest “[a]n image processing system comprising means for electronically displaying an image, means for capturing a first version of said displayed image, and means, connected to said means for electronically displaying and said means for capturing, for passively testing said first version of said displayed image captured by said means for capturing to determine if a portion of said displayed image is blocked from said means for capturing and for actively testing said portion of said displayed image based on said first version of said displayed image and a second version of said displayed image to confirm whether said portion of said displayed image is blocked from said means for capturing, wherein said second version of said displayed image is captured by said means for capturing after being displayed on said means for electronically displaying.” (Claim 25).

As explained above, Blank is generally directed to the traditional systems and methods of filming an actor in front of a *monochromatic background*, which background is later replaced with a desired background image, while retaining the actor in the foreground. (See, e.g., Blank, col. 3, ll. 1-6; col. 6, ll. 1-3; and Fig.1). Specifically, Blank teaches a

“monochrome background 24, which can be any desired color.” (Blank, col. 6, ll. 2-3). In sum, Blank simply teaches the use of, for example, a monochromatic screen in a system that utilizes a technology similar to chromakey, and does not teach, “means, connected to said means for electronically displaying and said means for capturing, for passively testing said first version of *said displayed image captured by said means for capturing.*” (Claim 25) (emphasis added). Thus, the system of Blank may be contrasted with, for example, Fig. 2 of Appellant’s disclosure in which an electronic display (22) is placed as the background instead of a monochromatic background as taught in Blank. With this background, Appellant respectfully asserts that Blank does not teach or suggest the subject matter of claim 25.

First, Appellant asserts that Blank does not teach or suggest, “wherein said second version of said displayed image is captured by said means for capturing after being displayed on *said means for electronically displaying.*” (Claim 25) (emphasis added). In connection with this subject matter, the Examiner’s Answer argues, “element 20 is a video display which displays the object, 22 and background 24, while being displayed, an image is captured using a video grabber, discussed on column 6, lines 60 to column 7, line 3.” (Examiner’s Answer, pp. 10 and 21). The cited portion of Blank teaches:

As shown in Roman numeral I of FIG. 5, only a portion 54 of the camera view is digitized for processing by the Transputer 44. Ordinarily, the signal from the camera 16 is an analog signal, and is digitized into a two-dimensional matrix of pixels (represented in Roman numeral II in FIG. 5) by a video frame grabber such as graphics daughterboard available from perihelion of the United Kingdom, which is included in the transputer 44. (Blank, col. 6, l. 60 through col. 7, l. 3).

However, it is clear from this portion that Blank simply teaches taking individual, digital still frames from an analog video signal. This can not be considered as equivalent to capturing a displayed image with an image capture device after the image is displayed on an electronic display device. Therefore, Blank does not teach or suggest, “wherein said second

version of said displayed image is captured by said means for capturing after being displayed on *said means for electronically displaying.*” (Claim 25) (emphasis added). For at least this reason, the rejection of claim 25 should not be sustained.

Further, on this point, the final Office Action of December 16, 2009 argued that “[s]ince the images in figures 5A-5D are taken in sequences, and the images of the object 22 and display device 24, are constantly displayed on the *electronic display*, 22, Blank reads on wherein said second version of said displayed image is captured by means for capturing after being displayed on said means for *electronically displaying.*” (final Office Action, p. 2). However, this is incorrect.

Blank simply teaches displaying on a monitor 20 an image of a subject 22 and a monochromatic background 24. Clearly, it is physically impossible in the system of Blank for the video camera 16 to capture an image of the monitor 20 because the video camera 16 and monitor 20 are housed in a single apparatus 12. (*See, e.g.*, Blank, Fig. 1). In this manner, the video camera 16 cannot be directed at or toward the monitor 20 in order to capture images of the monitor 20. Stated another way, the video camera 16 of Blank is always directed toward the subject 22 and the monochromatic background 24, and is entirely incapable of imaging the monitor 20. Further, Blank does not teach or suggest that the video camera 16 is capable of imaging the images displayed on the monitor 20. Thus, the system of Blank physically can not “means for electronically displaying an image, means for capturing a first version of said displayed image, and means, connected to said means for electronically displaying and said means for capturing, for passively testing . . . and for actively testing said portion of said displayed image based on said first version of said displayed image and a second version of said displayed image to confirm whether said portion of said displayed image is blocked from said means for capturing, *wherein said second version of said displayed image is captured*



*by said means for capturing after being displayed on said means for electronically displaying.”* (Claim 25) (emphasis added).

Second, Appellant respectfully asserts that Blank fails to teach or suggest, “means, connected to said means for electronically displaying and said means for capturing, for *passively testing* said first version of said displayed image captured by said means for capturing to determine if a portion of said displayed image is blocked from said means for capturing and for *actively testing* said portion of said displayed image based on said first version of said displayed image and a second version of said displayed image to confirm whether said portion of said displayed image is blocked from said means for capturing.” (Claim 25) (emphasis added). On this point, the Examiner’s Answer argues, “[t]he examiner does not view the limitations passively testing and actively testing as having special definition. Rather, they are given the broadest reasonable interpretation.” (Examiner’s Answer, p. 13). Appellant respectfully disagrees. Passively testing and actively testing are defined in Appellant’s original specification as follows:

This processing involves controlling both the image capture device 20 and the display 22 to cast a virtual shadow of any object(s) which are blocking the image capture device's view of the display. This is accomplished, according to exemplary embodiments of the present invention, by using both an active and a passive testing technique. The *passive technique estimates the image rendered on the display 22 and uses this estimate to determine whether individual pixels are being occluded, without manipulating the display 22*. The *active technique changes pixels on the display 22 to a known color and then the processor 24 observes changes (or lack thereof) in the images subsequently captured by the image capture device 20*. Thus, according to exemplary embodiments of the present invention, the passive technique can be used to identify pixels which are potentially occluded and then, using these pixels as seed areas, the active technique tests and grows these regions outwardly until the occlusion's boundaries are discovered.

(Appellant’s specification, para. [0022], [0024], and [0026], and Figure 4A).

Thus, clearly Appellant's specification provides definitions of "passively testing" and "actively testing."

In light of the above findings with regard to "passively testing" and "actively testing," Appellant respectfully asserts that Blank does not teach or suggest, "means, connected to said means for electronically displaying and said means for capturing, for *passively testing* said first version of said displayed image captured by said means for capturing to determine if a portion of said displayed image is blocked from said means for capturing and for *actively testing* said portion of said displayed image based on said first version of said displayed image and a second version of said displayed image to confirm whether said portion of said displayed image is blocked from said means for capturing." (Claim 25) (emphasis added). As Appellant has stated in previous prosecution, it is clear that although the system of Blank includes a processor configured to process images, the processor of Blank is only configured to store a digital image of an object and a background, locate the edge of an object, and remove portions of the image (i.e., the background) that are outside the edge. (*See*, Blank, Abstract; *passim*). Blank is silent with regard to a processor configured to passively and actively test displayed images to determine if a portion of the displayed images are blocked from an image capture device.

Specifically, Blank is silent regarding an active technique that changes pixels on a display to a known color and then observes changes (or lack thereof) in the images subsequently captured by an image capture device. The Examiner's Answer argues that this active technique is taught by Blank, and states, "the coarse stripping operation determines whether the current pixel should be part of the edge of a box, wherein the edge of a box contains plurality of pixels determined in steps discussed previously on column 8, lines 44-53." (Examiner's Answer, pp. 20-21). However, this portion of Blank, as well as throughout

the Blank reference, simply teaches detection of the edge of an object in front of a monochromatic screen and separates the object from the monochromatic screen. (*See, e.g.,* Blank, col. 2, ll. 63-68). Blank is silent regarding changing pixels on a display to a known color and then observing changes (or lack thereof) in the images subsequently captured by an image capture device. For at least this additional reason, the rejection of claim 25 should not be sustained.

Third, in contrast to Blank, claim 25 recites displayed images being displayed on an electronic display device, not merely a monochromatic background. Specifically, claim 25 recites, “*means for electronically displaying an image, means for capturing a first version of said displayed image*, and means . . . for passively testing said first version of said displayed image captured by said means for capturing . . . wherein said second version of said displayed image is captured by said means for capturing after being displayed on said means for electronically displaying.” (Claim 25) (emphasis added). The display device is then imaged with an imaging device including any objects in the foreground, e.g. a person. The image is then processed to create a virtual shadow of any objects in the foreground, i.e., in front of the electronic display device. This subject matter is clearly not taught or suggested by Blank.

Respectfully, to anticipate a claim, a reference must teach each and every element of the claim, and “the identical invention must be shown *in as complete detail as contained in the ... claim.*” MPEP 2131 citing *Verdegaal Bros. v. Union Oil Co. of California*, 814 F.2d 628, 2 USPQ2d 1051 (Fed. Cir. 1987) and *Richardson v. Suzuki Motor Co.*, 868 F.2d 1226, 9 USPQ2d 1913 (Fed. Cir. 1989) (emphasis added). Moreover, “[t]he prior art reference—in order to anticipate under 35 U.S.C. § 102—must not only disclose all elements of the claim within the four corners of the document, but must also disclose those elements ‘arranged as in

the claim.”” *NetMoneyIn v. Verisign*, (Fed. Cir. 2008) (quoting *Connell v. Sears, Roebuck & Co.*, 722 F.2d 1542 (Fed. Cir. 1983)).

In the present case, Blank clearly does not disclose the claimed invention with each and every claimed element in the same amount of detail or as arranged in the claim. Consequently, because Blank clearly fails to satisfy the requirements for anticipating claim 25, the rejection of claim 25 and its dependent claims should not be sustained.

Additionally, various dependent claims of the application recite subject matter that is further patentable over the cited prior art. Specific, non-exclusive examples follow.

Claim 8:

Claim 8 recites:

The method of claim 7, wherein said step of passively testing further comprises the step of:

***comparing a value of each pixel of said first version of said displayed image captured by said image capture device to a corresponding value of each pixel of said displayed image.***

(Emphasis added).

In contrast, Blank does not teach or suggest, “comparing a value of each pixel of said first version of said displayed image captured by said image capture device to a corresponding value of each pixel of said displayed image.” (Claim 8). Blank simply teaches the step of systematically comparing the hue gamma of a standard pixel with a neighboring pixel to determine if the neighboring pixel is different. In other words, the system of Blank simply compares neighboring pixels within a single image.

However, claim 8 recites, “comparing a value of each pixel of said first version of said displayed image captured by said image capture device to a corresponding value of each pixel

of said displayed image.” In other words, the subject matter of claim 8 compares values of pixels within a displayed image captured by said image capture device with values of pixels within the image itself. This subject matter is clearly not taught or suggested by Blank.

Again, to anticipate a claim, a reference must teach each and every element of the claim, and “the identical invention must be shown *in as complete detail as contained in the ... claim.*” MPEP 2131 citing *Verdegaal Bros. v. Union Oil Co. of California*, 814 F.2d 628, 2 USPQ2d 1051 (Fed. Cir. 1987) and *Richardson v. Suzuki Motor Co.*, 868 F.2d 1226, 9 USPQ2d 1913 (Fed. Cir. 1989) (emphasis added). Moreover, “[t]he prior art reference—in order to anticipate under 35 U.S.C. § 102—must not only disclose all elements of the claim within the four corners of the document, but must also disclose those elements ‘arranged as in the claim.’” *NetMoneyIn v. Verisign*, (Fed. Cir. 2008) (quoting *Connell v. Sears, Roebuck & Co.*, 722 F.2d 1542 (Fed. Cir. 1983)).

In the present case, Blank clearly does not disclose the claimed invention with each and every claimed element in the same amount of detail or as arranged in the claim. Consequently, because Blank clearly fails to satisfy the requirements for anticipating claim 8, the rejection of claim 8 should not be sustained.

Claim 14:

Claim 14 recites:

The computer-readable medium of claim 13, wherein said step of passively testing further comprises the step of:

***comparing a value of each pixel of said first version of said displayed image captured by said image capture device to a corresponding value of each pixel of said displayed image.***

(Emphasis added).

In contrast, Blank does not teach or suggest, “comparing a value of each pixel of said first version of said displayed image captured by said image capture device to a corresponding value of each pixel of said displayed image.” (Claim 14). Blank simply teaches the step of systematically comparing the hue gamma of a standard pixel with a neighboring pixel to determine if the neighboring pixel is different. In other words, the system of Blank simply compares neighboring pixels within a single image.

However, claim 14 recites, “comparing a value of each pixel of said first version of said displayed image captured by said image capture device to a corresponding value of each pixel of said displayed image.” In other words, the subject matter of claim 14 compares values of pixels within a displayed image captured by said image capture device with values of pixels within the image itself. This subject matter is clearly not taught or suggested by Blank.

Again, to anticipate a claim, a reference must teach each and every element of the claim, and “the identical invention must be shown *in as complete detail as contained in the ... claim.*” MPEP 2131 citing *Verdegaal Bros. v. Union Oil Co. of California*, 814 F.2d 628, 2 USPQ2d 1051 (Fed. Cir. 1987) and *Richardson v. Suzuki Motor Co.*, 868 F.2d 1226, 9 USPQ2d 1913 (Fed. Cir. 1989) (emphasis added). Moreover, “[t]he prior art reference—in order to anticipate under 35 U.S.C. § 102—must not only disclose all elements of the claim within the four corners of the document, but must also disclose those elements ‘arranged as in the claim.’” *NetMoneyIn v. Verisign*, (Fed. Cir. 2008) (quoting *Connell v. Sears, Roebuck & Co.*, 722 F.2d 1542 (Fed. Cir. 1983)).

In the present case, Blank clearly does not disclose the claimed invention with each and every claimed element in the same amount of detail or as arranged in the claim.

Consequently, because Blank clearly fails to satisfy the requirements for anticipating claim 14, the rejection of claim 14 should not be sustained.

Claim 20:

Claim 20 recites:

The system of claim 19, wherein said processor performs said passive testing by ***comparing a value of each pixel of said version of said displayed image captured by said image capture device to a corresponding value of each pixel of said displayed image.***

(Emphasis added).

In contrast, Blank does not teach or suggest, “comparing a value of each pixel of said version of said displayed image captured by said image capture device to a corresponding value of each pixel of said displayed image.” (Claim 20). Blank simply teaches the step of systematically comparing the hue gamma of a standard pixel with a neighboring pixel to determine if the neighboring pixel is different. In other words, the system of Blank simply compares neighboring pixels within a single image.

However, claim 20 recites, “comparing a value of each pixel of said version of said displayed image captured by said image capture device to a corresponding value of each pixel of said displayed image.” In other words, the subject matter of claim 20 compares values of pixels within a displayed image captured by said image capture device with values of pixels within the image itself. This subject matter is clearly not taught or suggested by Blank.

Again, to anticipate a claim, a reference must teach each and every element of the claim, and “the identical invention must be shown ***in as complete detail as contained in the ... claim.***” MPEP 2131 citing *Verdegaal Bros. v. Union Oil Co. of California*, 814 F.2d 628, 2 USPQ2d 1051 (Fed. Cir. 1987) and *Richardson v. Suzuki Motor Co.*, 868 F.2d 1226, 9 USPQ2d 1913 (Fed. Cir. 1989) (emphasis added). Moreover, “[t]he prior art reference—in

order to anticipate under 35 U.S.C. § 102—must not only disclose all elements of the claim within the four corners of the document, but must also disclose those elements ‘arranged as in the claim.’” *NetMoneyIn v. Verisign*, (Fed. Cir. 2008) (quoting *Connell v. Sears, Roebuck & Co.*, 722 F.2d 1542 (Fed. Cir. 1983)).

In the present case, Blank clearly does not disclose the claimed invention with each and every claimed element in the same amount of detail or as arranged in the claim. Consequently, because Blank clearly fails to satisfy the requirements for anticipating claim 20, the rejection of claim 20 should not be sustained.

(2) Claims 12, 18, and 24 are patentable over *Blank* and *Eschbach*:

The rejection of claims 12, 18, and 24 should not be sustained for at least the same reasons given above in favor of the patentability of independent claims 7, 13, and 19, respectively.



In view of the foregoing, it is submitted that the final rejection of the pending claims is improper and should not be sustained. Therefore, a reversal of the Rejection of December 16, 2009 is respectfully requested.

Respectfully submitted,

DATE: November 8, 2010

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